TCEQ Interoffice Memorandum

To: Luda Voskov, Project Manager; Superfund Section, Remediation Division

From: Larry Champagne, Ecological Risk Assessor; Technical Support Section, Remediation Division

Date: October 18, 2010

Subject: Gulfco Marine Maintenance Superfund Site
Baseline Ecological Risk Assessment, Day 60 Deliverable
October 4, 2010

As requested, I have reviewed the toxicity data included in this report for purposes of determining whether or not to proceed with the Engineering Evaluation/Cost Analysis (EE/CA). Focusing on the sediment toxicity data, I found numerous discrepancies between the text, summary tables, and laboratory data which I discussed with EPA's Gary Miller and Susan Roddy in a conference call on October 7, 2010. The consultants URS and Pastor, Behling & Wheeler have also been informed of these discrepancies and my understanding is that they are seeking clarification from the testing laboratory and that everything will be rectified in the upcoming Preliminary Site Characterization Report.

In the meantime, I recommend that the EE/CA contractor conduct a thorough evaluation of the raw data from the current report, including any subsequent clarification information from the laboratory. However, the existing results, which I do not expect to change, indicate that although the test sediments were toxic, the reference sediment locations also exhibited toxicity, were statistically significantly different from the control samples, and did not appear to be different from the test sediments. Based on the inconclusiveness of these results, I further recommend that the EE/CA proceed, but that any sediment removal activities be postponed, unless these results can be refined to identify areas of sediment toxicity hot spots that can be removed. Otherwise, additional evaluation of chemical of potential ecological concern (COPEC) impacts to the sediment is needed.

Given the deadlines imposed by the Unilateral Administrative Order, it is doubtful there is time to conduct any more field studies or collect additional samples. This may mean that we will need to rely heavily on the sediment chemistry data to make ecological risk management decisions. However, rather than using the TCEQ sediment protective concentration level (PCL) values, I suggest that the Gulfco consultants and/or the EE/CA contractor conduct a mean Effects Range Medium (ERM)-Quotient analysis approach, as described in Long, et al. (1998). As presented in previous TCEQ comments on this site, ERM sediment represents the 50th percentile concentration for the ranked sediment COPEC concentrations associated with a biological effect and marks the point above which effects become more probable. Further knowledge of potential sediment cumulative toxicity can be gained by looking at ERM values in combination as a mean quotient in multiple contaminant sites such as present at Gulfco. As such, an ERM-quotient would likely be a more reliable indicator of the potential for risk to exposed

benthic receptors than the PCL. Furthermore, the resulting quotients for each sediment sample can be evaluated using the methodology of Long and McDonald (1998) and the resulting probabilities of toxicity to benthic organisms can be grouped as follows:

Category 1 (lowest priority): Mean ERM-Q < 0.1
Category 2 (medium-low priority): 0.1≤ Mean ERA-Q < 0.5
Category 3 (medium-high priority): 0.5≤ Mean ERA-Q < 1.5
Category 4 (highest priority): Mean ERA-Q ≥ 1.5

Focus could then be turned to those areas that fall into categories 3 and 4 as it is likely that these areas are most influencing the risk. However, any removal of sediment, particularly in marsh areas, will need to be conducted with care. Utilizing heavy equipment could cause harm to unimpacted sediment habitat. Where feasible, removal should be conducted by hand.

References:

Long, E.R., L. J. Field and D.D. McDonald. 1998. Predicting Toxicity in Marine Sediments with Numerical Sediment Quality Guidelines. Environmental Toxicology and Chemistry, Vol. 17, No. 4, pp. 714–727.

Long, E.R. and D.D. McDonald. 1998. Perspective: Recommended Uses of Empirically Derived, Sediment Quality Guidelines for Marine and Estuarine Ecosystems. Human and Ecological Risk Assessment, Vol. 4, No. 5, pp. 1019-1039.